

# Design & Access Statement

## Solar PV Installation Site 2

### D. R. Collin & Son Ltd, Eyemouth, Scottish Borders

D R Collin & Son Ltd

Site 2

Acredale Ind Estate, Eyemouth TD14 5LQ

### Brief

This design & access statement is meant to inform the reader of the size, scale, form and policies that have been considered by the applicant when applying for planning permission.

Prepared by	Date	Signature
Simon Maden Bsc Build. Surv.	05 <sup>th</sup> Feb 2024	





Applicant

D. R. Collin & Son Ltd  
Unit 1 Industrial Estate,  
Coldingham Road,  
Eyemouth,  
Berwickshire,  
TD14 5AN, Scotland

Agent

Maden Eco Ltd  
Eco House  
Kings Mount  
Ramparts Bs Pk  
Berwick upon Tweed  
Northumberland  
TD15 1TQ

Tel: 01289 333110

Contact: Simon Maden BSc Build. Surv. 07801 634632

Grid Reference: NT 93743 64081

Grid reference (6 figure): NT937640

Easting X: 393743

Northing Y: 664081

### Scope of Works

The applicant D. R. Collin & Son Ltd is applying for Planning Permission to install solar photovoltaic panels (PV) on the premises roofs in a size exceeding 50kw of output. Under current planning guidance this requires a full planning application.

### 1.0 Existing site



## 2.0 Use

The intended use of the application is that of a solar pv installation to reduce the amount of bought in power and move towards self-generated power for the site.

The applicant is aware that the system has already been installed but they were not advised by the installer ( Not Maden Eco Ltd) that it was a requirement to apply for planning permission for system over 50kw in size. This application is aimed at correcting this and while ignorance of planning regulations is no defence the applicant since engaging with Maden Eco Ltd is being advised correctly and putting right all matters in relation to energy efficiency program at the company.

## 3.0 Scale

Existing Site Consumptions

SITE 2	DAYTIME	TOTAL
Main supply	737,419 kwh	737,419 kwh
Blue Shed	113,888 kwh	113,888 kwh

## 4.0 Amount

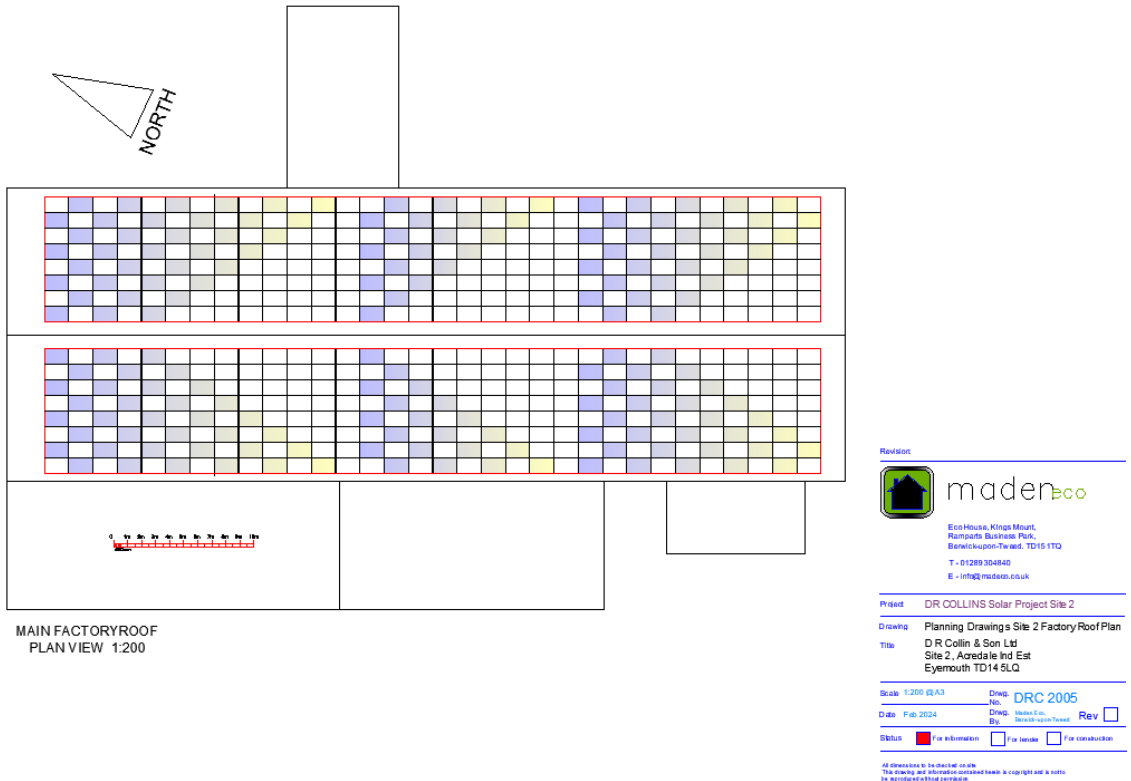
Based on the findings in the scale of the project we are able to design an amount of solar to have the maximum effect on that energy demand.

We can confirm that we have designed the following Systems:

410 JA solar 410W Black Framed Mono (White Backsheet) solar panels

The panels will be connected to 4 Solis S5-GC40K 3ph inverters.

Total installed capacity 209kW



This will generate approximately 146,300 kWh of energy @ 700 kwh/kw installed which will be consumed by the plant and surplus exported to the grid and consumed by local business and households on the same local network. This is a saving of 57,349 kgCO<sub>2</sub>e/pa. Based on National Grid PLC data of 392g CO<sub>2</sub>/Kwh produced by gas powered power stations which still often contribute 30-40% of the daily uk energy requirement.

Data on panel to be used.



Higher output power



Lower LCOE



Less shading and lower resistive loss

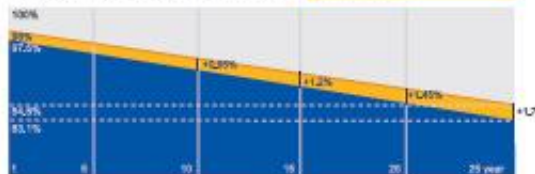


Better mechanical loading tolerance

**Superior Warranty**

- 12-year product warranty
- 25-year linear power output warranty

0.55% Annual Degradation Over 25 years



■ New linear power warranty ■ Standard module linear power warranty

**Comprehensive Certificates**

- IEC 61215, IEC 61730, UL 61215, UL 61730
- ISO 9001: 2015 Quality management systems
- ISO 14001: 2015 Environmental management systems
- ISO 45001: 2018 Occupational health and safety management systems
- IEC TS 62941: 2016 Terrestrial photovoltaic (PV) modules – Guidelines for increased confidence in PV module design qualification and type approval



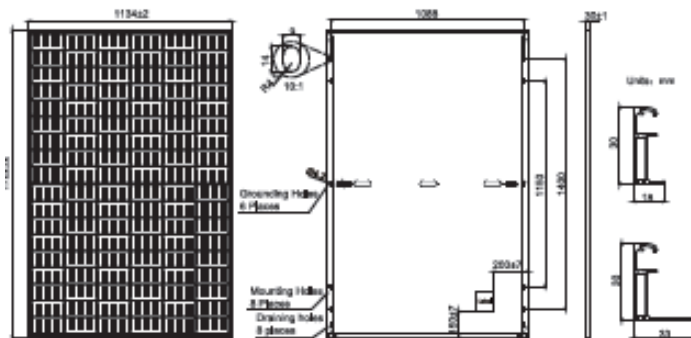
**JA SOLAR**

[www.jasolar.com](http://www.jasolar.com)

Specifications subject to technical changes and tests. JA Solar reserves the right of final interpretation.



**MECHANICAL DIAGRAMS**



Remark: customized frame color and cable length available upon request

**SPECIFICATIONS**

Cell	Mono
Weight	21.5kg±3%
Dimensions	1722±2mm×1134±2mm×30±1mm
Cable Cross Section Size	4mm <sup>2</sup> (IEC) , 12 AWG(UL)
No. of cells	108(6x18)
Junction Box	IP68, 3 diodes
Connector	QC 4.10(1000V) QC 4.10-36(1500V)
Cable Length (Including Connector)	Portrait: 300mm(+)/400mm(-); Landscape: 1200mm(+)/1200mm(-)
Packaging Configuration	35pcs/Pallet, 936pcs/40ft Container

**ELECTRICAL PARAMETERS AT STC**

TYPE	JAM54S30 +390/MR	JAM54S30 +395/MR	JAM54S30 +400/MR	JAM54S30 +405/MR	JAM54S30 +410/MR	JAM54S30 +415/MR
Rated Maximum Power(Pmax) [W]	390	395	400	405	410	415
Open Circuit Voltage(Voc) [V]	36.85	36.98	37.07	37.23	37.32	37.45
Maximum Power Voltage(Vmp) [V]	30.84	30.84	31.01	31.21	31.45	31.81
Short Circuit Current(Isc) [A]	13.61	13.70	13.79	13.87	13.95	14.02
Maximum Power Current(Imp) [A]	12.73	12.81	12.90	12.98	13.04	13.13
Module Efficiency [%]	20.0	20.2	20.5	20.7	21.0	21.3
Power Tolerance	0~+5W					
Temperature Coefficient of Isc(α <sub>Isc</sub> )	+0.045%/°C					
Temperature Coefficient of Voc(β <sub>Voc</sub> )	-0.275%/°C					
Temperature Coefficient of Pmax(γ <sub>Pmp</sub> )	-0.350%/°C					
STC	Irradiance 1000W/m <sup>2</sup> , cell temperature 25°C, AM1.5G					

Remark: Electrical data in this catalog do not refer to a single module and they are not part of the offer. They only serve for comparison among different module types.

**ELECTRICAL PARAMETERS AT NOCT**

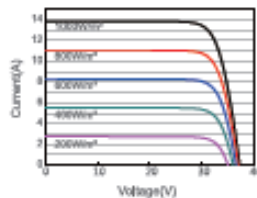
TYPE	JAM54S30 +390/MR	JAM54S30 +395/MR	JAM54S30 +400/MR	JAM54S30 +405/MR	JAM54S30 +410/MR	JAM54S30 +415/MR
Rated Max Power(Pmax) [W]	294	298	302	305	310	314
Open Circuit Voltage(Voc) [V]	34.62	34.75	34.88	35.12	35.23	35.37
Max Power Voltage(Vmp) [V]	28.07	28.08	28.26	29.47	29.72	29.89
Short Circuit Current(Isc) [A]	10.09	10.06	11.03	11.10	11.16	11.22
Max Power Current(Imp) [A]	10.18	10.25	10.32	10.38	10.43	10.50
NOCT	Irradiance 800W/m <sup>2</sup> , ambient temperature 20°C, wind speed 1m/s, AM1.5G					

**OPERATING CONDITIONS**

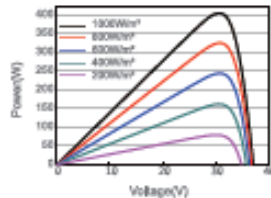
Maximum System Voltage	1000V/1500V DC
Operating Temperature	-40°C ~ +85°C
Maximum Series Fuse Rating	25A
Maximum Static Load, Front*	5400Pa(112lb/ft <sup>2</sup> )
Maximum Static Load, Back*	2400Pa(50lb/ft <sup>2</sup> )
NOCT	45±2°C
Safety Class	Class II
Fire Performance	UL Type 1

**CHARACTERISTICS**

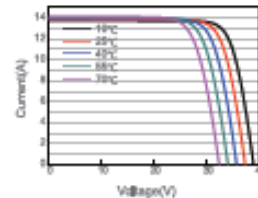
Current-Voltage Curve JAM54S30-405/MR



Power-Voltage Curve JAM54S30-405/MR



Current-Voltage Curve JAM54S30-405/MR



Premium Cells, Premium Modules

Version No. : Global\_EN\_20210331

Data on Inverters




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## Solis-(25-50)K-5G

Solis Three Phase Inverters





360 degree

**Features:**

- ▶ Max. efficiency 98.8%
- ▶ Wide voltage range and low startup voltage
- ▶ 3/4 MPPT design with precise MPPT algorithm
- ▶ THDI<3%, low harmonic distortion against grid
- ▶ Anti-resonance, supporting over 6MW paralleled in one transformer
- ▶ Perfect commercial site monitoring solution
- ▶ 130% DC overload ratio, 13A input for each PV string
- ▶ Strings intelligent monitoring, Smart I-V curve scan
- ▶ Fuse free design to avoid fire hazard
- ▶ Type II surge arrester for both DC and AC
- ▶ Natural convection, Fan-less design, longer lifespan
- ▶ Leakage current repression technology
- ▶ Volt-watt work mode integrated
- ▶ DC input reverse alarm
- ▶ Intergrated Export Power Manager (EPM)



**Model:**

**400V:** Solis-25K-5G   Solis-30K-5G  
 Solis-33K-5G   Solis-36K-5G  
 Solis-40K-5G

**480V:** Solis-40K-HV-5G   Solis-50K-HV-5G



## Datasheet

Model Name	Solis-25K-SG	Solis-30K-SG	Solis-33K-SG	Solis-36K-SG	Solis-40K-SG	Solis-40K-HV-SG	Solis-50K-HV-SG
<b>Input DC</b>							
Recommended max. PV power	33 kW	39 kW	43 kW	47 kW	52 kW	52 kW	65 kW
Max. input voltage	1100 V						
Rated voltage	600 V						
Start-up voltage	180 V						
MPPT voltage range	200-1000 V						
Max. input current	26 A / 26 A / 26 A			4*26 A			
Max. short circuit current	40 A / 40 A / 40 A			4*40 A			
MPPT number/Max. input strings number	3/6			4/8			
<b>Output AC</b>							
Rated output power	25 kW	30 kW	33 kW	36 kW	40 kW	40 kW	50 kW
Max. apparent output power	27.5 kVA	33 kVA	36.3 kVA	39.6 kVA	44 kVA	44 kVA	55 kVA
Max. output power	27.5 kW	33 kW	36.3 kW	39.6 kW	44 kW	44 kW	55 kW
Rated grid voltage	3/N/PE, 220 V / 380 V, 230 V / 400 V					3/PE, 480 V	
Rated grid frequency	50 Hz / 60 Hz						
Rated grid output current	38.0 A / 36.1 A	45.6 A / 43.3 A	50.1 A / 47.6 A	54.7 A / 52.0 A	60.8 A / 57.7 A	48.1 A	60.1 A
Max. output current	41.8 A	50.2 A	55.1 A	60.2 A	66.9 A	53.0 A	66.2 A
Power Factor	>0.99 (0.8 leading - 0.8 lagging)						
THDi	<3%						
<b>Efficiency</b>							
Max. efficiency	98.8%						
EU efficiency	98.3%						
<b>Protection</b>							
DC reverse-polarity protection	Yes						
Short circuit protection	Yes						
Output over current protection	Yes						
Surge protection	DC Type II / AC Type II						
Grid monitoring	Yes						
Anti-islanding protection	Yes						
Temperature protection	Yes						
Strings monitoring	Yes						
I/V Curve scanning	Yes						
Anti-PID function	Optional						
Integrated DC switch	Optional						
<b>General Data</b>							
Dimensions (W*H*D)	647*629*252 mm						
Weight	45 kg						
Topology	Transformerless						
Self consumption (night)	<1 W						
Operating ambient temperature range	-25 ~ +60°C						
Relative humidity	0-100%						
Ingress protection	IP65						
Cooling concept	Natural convection						
Max. operation altitude	4000 m						
Grid connection standard	G98 or G99, VDE-AR-N 4105 / VDE V 0124, EN 50549-1, VDE 0126 / UTE C 15 / VFR:2019, RD 1699 / RD 244 / UNE 206006 / UNE 206007-1, CEI 0-21, C10/11, NRS 097-3-1, TOR, EIFS 2018.2, IEC 62116, IEC 61727, IEC60068, IEC 61683, EN 50530						
Safety/EMC standard	IEC/EN 62109-1/-2, IEC/EN 61000-6-1/-2/-3/-4						
<b>Features</b>							
DC connection	MC4 connector						
AC connection	OT terminal						
Display	LCD						
Communication	RS485, Optional: Wi-Fi, GPRS						

The second system on the blue shed is constrained by size but we can still get a small 19kw system on the roof which will generate around 13,000 kwh. This will reduce the carbon by 5096kg of CO2

This system will be 44 No Trina Vertex S PV panels with a 15kw 3 phase solax inverter



**NEW FROM SOLAX**  
**X3-PRO G2**



**X3-PRO G2**  
8.0kW/10.0kW/12.0kW/15.0kW  
17.0kW/20.0kW/25.0kW/30.0kW

**Features**

**High-efficiency**

- Maximum efficiency is up to 98.5%
- Low startup voltage, ultrawide MPPT voltage range
- 150% oversizing, 110% overloading output
- Built-in shadow tracking function

**Safe**

- SPD type II protection both AC&DC
- ARC protection (Optional)
- IP66 protection

**Smart**

- Built-in export power control
- Intelligent load management - heat pump (Optional)
- 24 hours operation monitoring
- Multiple monitoring methods, Pocket WiFi/LAN/4G (Optional)

**Economic**

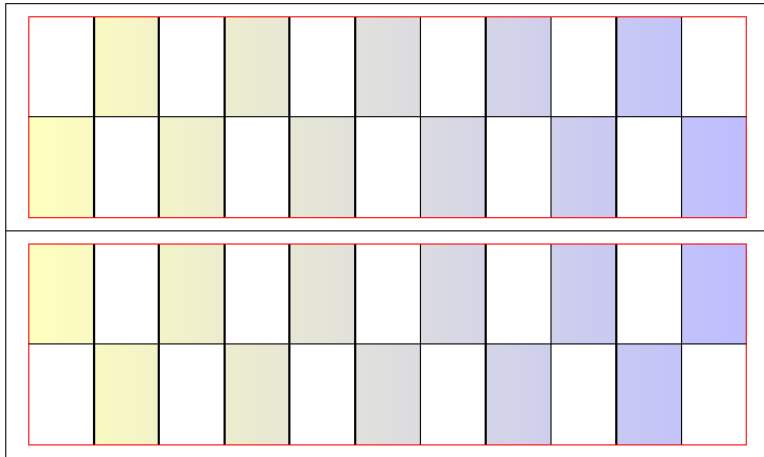
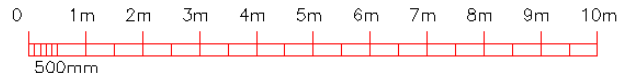
- Ultra-high power density
- Maximum 16A DC input current, support high power solar panel
- Up to 3 MPPTs, 2 strings per MPPT

**Contact Us More Information**

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service@solaxpower.com



SHED B ROOF PLAN 1:50

Revision:



maden eco  
Eco House, Kings Mount,  
Ramparts Business Park,  
Berwick-upon-Tweed, TD15 1TQ  
T: 01289 334840  
E: info@maden.co.uk

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Project: DR COLLINS Solar Project Site 2

Drawn By: Planning Drawings Site 2 Shed B Roof Plan

Title: D R Collin & Son Ltd  
Site 2, Airedale Ind Est  
Eyemouth TD14 5LQ

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Scale: 1:50 @ A3      Drawn By: DRC 2006

Date: Feb 2024      Drawn By: Status:  For information    For tender    For construction

As recommended to be checked on site.  
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## POLICY

Following the Examination of the proposed new Local Development Plan (LDP), as recommended by the Reporter, policy ED9 – Renewable Energy Development confirms Scottish Borders Council will produce this SG and submit it to Scottish Ministers within 12 months of the adoption of the new Plan. The new Plan was adopted on 12th May 2016.

National planning policy and guidance promotes and supports renewable energy to facilitate the transition to a low carbon economy. The Climate Change (Scotland) Act 2009 requires all public bodies to contribute to the emissions targets in the Act and to deliver the Government’s climate change programme. The need to mitigate the causes of climate change and the need to adapt to its short- and long-term impacts should be taken into account in all decisions within the planning process.

National Planning Framework 3 and SPP are supportive of promoting renewable energy and identify the need to support other key sustainability principles of social, economic and environmental considerations.

Scottish Borders Council has been proactive in supporting a range of renewable energy types. In implementing statutory duties to support both renewable energy and protect the landscape and the environment, the Council seeks a balance between these objectives within the decision-making process.

## NATIONAL POLICY

### NATIONAL PLANNING FRAMEWORK 3 (NPF3)

National Planning Framework 3 is a longer-term spatial expression of the Government Economic Strategy. One of the principal thrusts of this strategy for Scotland is the promotion and support for increasing sustainable economic growth. It promotes renewable energy; expressing delivery targets to be achieved and recognises the need to support sustainability principles of protecting the landscape and the environment. SCOTTISH PLANNING POLICY (SPP) Scottish Planning Policy is supportive of renewable energy and identifies the requirement to promote key other sustainability principles of social, economic and environmental issues.

Paragraph 154 of SPP requires planning authorities, through their development plan,

- to support the development of a diverse range of electricity generation from renewable energy technologies - including the expansion of renewable energy generation capacity
- to guide development to appropriate locations and to advise on the issues that will be taken into account when specific proposals are being assessed

SPP seeks to ensure the full potential for renewable energy generation is achieved whilst at the same time giving due regard to environmental, community and cumulative impacts. SPP does not single out any sustainable types to have extra weighting over others. Paragraph 28 states that the planning system should “achieve the right development in the right place: it is not to allow development at any cost”.

## REGIONAL POLICY

### STRATEGIC DEVELOPMENT PLAN 2013

Policy 10 – Sustainable Energy Technologies is a high-level policy which states that the Strategic Development Plan seeks to promote sustainable energy sources. It requires that Local Development Plans will:

Set a framework for the encouragement of renewable energy proposals that aims to contribute towards achieving national targets for electricity and heat, taking into account relevant economic, social, environmental and transport considerations, to facilitate more decentralised patterns of energy generation and supply and to take account of the potential for developing heat networks.

## LOCAL POLICY

### SCOTTISH BORDERS ADOPTED LOCAL DEVELOPMENT PLAN 2016

Renewable energy is a wide-ranging subject and many LDP policies need to be considered during the application processing period. However, the most relevant is policy ED9 – Renewable Energy Development.

Policy ED9 in essence is supportive of a wide range of renewable energy types provided that there are no unacceptable significant adverse impacts or effects which cannot be mitigated. If there are then development will only be approved if the Council is satisfied that the wider economic, environmental and other benefits of the proposal outweigh the potential damage arising from it.

## NATIONAL ENERGY TARGETS

Scottish Planning Policy and Electricity Generation Policy Statement sets out the Scottish Government's current position regarding renewables.

Paragraph 154 of SPP states that the planning system should support the transformational change to a low carbon economy, consistent with national objectives and targets, including deriving:

- 30% of overall energy demand from renewable sources by 2020.
- 11% of heat demand from renewable sources by 2020; and
- the equivalent of 100% of electricity demand from renewable sources by 2020; There is no cap on these targets and the Council must therefore continue to support renewable energy proposals within appropriate locations. Progress on renewables approvals and implementations can be viewed on the Scottish Government's Energy Statistics for Scotland. (Please see reference to Scottish Energy Strategy: the future of energy in Scotland below regarding further updated energy targets).

## UpToDate National Policy

Scotland's ambitious climate change legislation sets a target date for net zero emissions of all greenhouse gases by 2045. Our contribution to climate change will end, definitively, within one generation.

To meet Scotland's targets, a rapid transformation across all sectors of our economy and society is required. We published our [Climate Change Plan update](#) in December 2020 which reflects the increased ambition of the new targets set by the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019.

Our [Net Zero Nation](#) website is a 'one stop shop' for individuals, communities and organisations looking for information about what they can do to tackle the climate emergency, and learn more about the action that all of Scotland is taking.

VISUAL IMPACT ASSESSMENT FROM WITHIN THE SITE SUBJECT OF APPLICATION



10 Images have been submitted from 9 view spots to assist the assessment of the application in terms of visual impact.

Leica 28mm wide angle lense

Images taken on 26<sup>th</sup> Jan 2024 1.00pm onwards.

Weather was cold and fine with clear sky and bright sunshine.

LOCATION	DISCRIPTION	VIEW OF ARRAY
A	Standing yard of DR Collin looking south by south east Collimation height 1.6m	Due to the height of the structure it is not possible to view the array from this location



LOCATION	DISCRIPTION	VIEW OF ARRAY
B	Standing on elevated bank yard of DR Collin looking south by south east Collimation height 1.6m	It is possible to view the array from this location. The array takes on the colours of the roof coverings and wall claddings around and does not loo dominant in the setting.



It is also proposed to install PV panels on the shed in the foreground of this image with the Kingspan insulated grey roof sheeting.



LOCATION	DISCRIPTION	VIEW OF ARRAY
C	Standing at edge of Yard looking southwest Collimation height 1.6m	It is not possible to view the array from this location. The building in close quarters does not allow for possible views of the roof.



LOCATION	DISCRIPTION	VIEW OF ARRAY
D	Standing at staff car park looking southeast Collimation height 1.6m	It is possible to view the array from this location.



LOCATION	DISCRIPTION	VIEW OF ARRAY
E	Standing at south west corner of building looking northeast Collimation height 1.6m	It is not possible to view the array from this location.



LOCATION	DISCRIPTION	VIEW OF ARRAY
E	Standing at south west corner of building looking east Collimation height 1.6m	It is not possible to view the array from this location.



LOCATION	DISCRIPTION	VIEW OF ARRAY
F	Standing at south of building looking north Collimation height 1.6m	It is not possible to view the array from this location.



LOCATION	DISCRIPTION	VIEW OF ARRAY
G	Standing at south of building looking north west Collimation height 1.6m	It is not possible to view the array from this location. As you move further away from this location it will be possible to view the panels on the roof.



LOCATION	DISCRIPTION	VIEW OF ARRAY
H	Standing at south east of building looking north west Collimation height 1.6m	It is possible to view the the edge of the array from this location. As you move further away from this location it will be possible to view the panels on the roof.



LOCATION	DISCRIPTION	VIEW OF ARRAY
H	Standing at south east of building looking north west Collimation height 1.6m	It is possible to view the the edge of the array from this location. As you move further away from this location it will be possible to view the panels on the roof.





LOCATION	DISCRIPTION	VIEW OF ARRAY
I	Standing at north end of building looking west Collimation height 1.6m	It is not possible to view the the edge of the array from this location. As you move further away from this location it will be possible to view the panels on the roof.



LOCATION	DISCRIPTION	VIEW OF ARRAY
I	Standing at north end of building looking south west Collimation height 1.6m	It is not possible to view the the edge of the array from this location. As you move further away from this location it will be possible to view the panels on the roof.



Visual Impact Images Small Shed 18kw installation – This shed has a large separate electricity supply within and is used to power overnight refrigeration on the trailers parked in the yard as well as other processes. It consumes over 113,000 kwh daytime pa.





